ATTIX 791-2M/B1

Nilfisk
ALTO
Why Compromise

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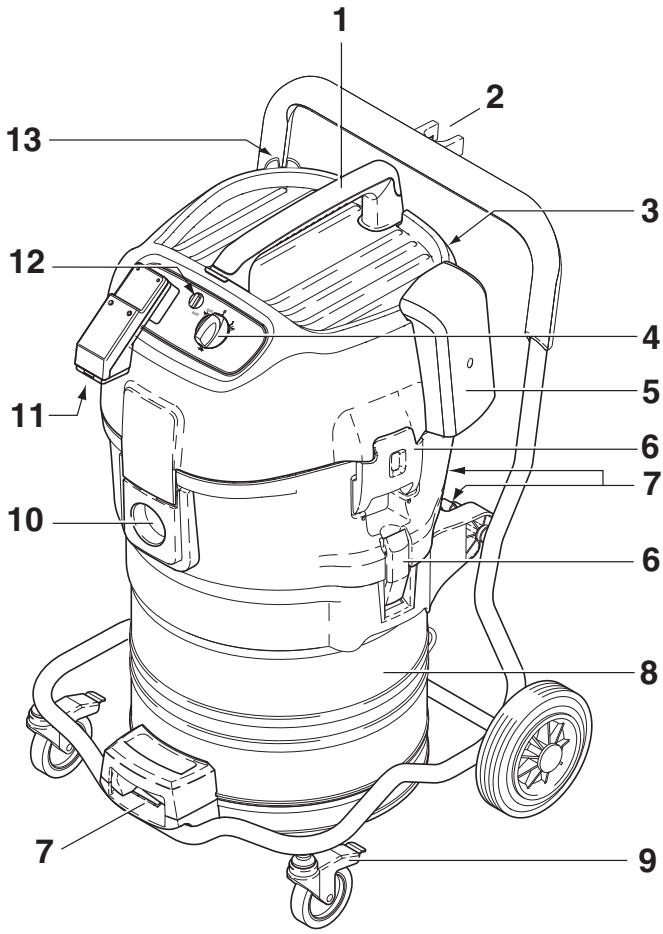
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EN 1 Important safety instructions

Symbols used to mark instructions

Before using the vacuum cleaner, always read the operating instructions and keep them readily available.

This symbol is used to mark safety instructions that must be observed to prevent damage to the vacuum cleaner and its performance.

This symbol is used to mark safety instructions that must be observed to prevent damage to persons.

This symbol indicates tips and instructions to simplify work and to ensure safe operation.

For your own safety

Only allow the vacuum cleaner to be used by persons who have been trained in its use and who have been explicitly authorized to use it.

Despite its simple handling the vacuum cleaner is not suitable for children.

The use of the vacuum cleaner is subject to valid national regulations. Besides the operating instructions and the binding accident prevention regulations valid in the country of use, observe recognized regulations for safety and proper use.

Do not use any unsafe work techniques.

Transport

Before transporting the dirt tank, close all the locks.

Do not tilt the cleaner if there is liquid in the dirt tank.

Do use a crane hook to lift the cleaner.

Purpose and intended use

The vacuum cleaners described in this operating manual are suitable for

- commercial use, e.g. in hotels, schools, hospitals, factories, shops, offices and rental businesses
- for separation of dust with an exposure limit of greater than 1 mg/m³
- to pick up flammable, dry dust in zone 22 (ATEX regulation 94/9/EG, Ex II 3D T4 IP54)

The following materials should not be picked up by the vacuum cleaner:

- hot materials (burning cigarettes, hot ash, etc.)
- flammable, explosive, aggressive liquids (e.g. petrol, solvents, acids, alkalis, etc.)
- mixtures of flammable dusts with liquids
- explosive substances or substances considered to be similar in §1 of the law on explosives
- flammable dusts with an extremely low minimum ignition energy <1 mJ (also observe national regulations).

Use the cleaner only if it is certain that no active sources of ignition can be sucked in.

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Conductive extraction equipment, e.g. extraction hoods on machines and conductive parts of machining equipment (e.g. equipment in protective class II) that are not earthed through the cleaner, must be earthed in some other way to prevent electrostatic charges.

The cleaner is not suitable for extraction on machining equipment in operation that could produce sources of ignition.

When dust removers are used, the rate at which air is exchanged in the room must be adequate if the exhaust air from the vacuum cleaner is blown into the room (please observe regulations valid in your country).

Before starting work, the operating staff must be informed on
– use of the vacuum cleaner
– risks associated with the material to be picked up
– safe disposal of the picked up material.

Precautions and safety regulations when using the vacuum cleaner

Before start-up

Inspect power cord regularly to detect signs of damage, e.g. cracks or ageing.

If the power cord is damaged, it must be replaced by Nilfisk-Alto-Service or an electrician to avoid danger before use of the vacuum cleaner is continued.

Use only the type of power cord specified in the operating manual.

Do not damage the power cord (e.g. by moving over it or pulling or crushing it).

Disconnect the power cord by pulling the plug only (do not pull or tug the power cord).

Inspect the vacuum cleaners to ensure that they are in proper condition. Plugs and couplings in power cords must at least have splash protection.

Never use the vacuum cleaner if the filter element is damaged.

Picking up liquids

If foam develops or liquid emerges, stop work immediately and empty the dirt tank.

Regularly clean the float that limits the water level and check it for damage.

See section 5 for information on handling liquids and (hazardous) dust.

Electrical components

Check the rated voltage of the vacuum cleaner before connecting it to the mains supply system. Ensure that the voltage shown on the rating plate corresponds to the voltage of the local mains power supply.

If you are using an extension cord, use only those specified by the manufacturer or higher quality ones (see section 9.4 „Technical data“).

It is recommended that the vacuum cleaner should be connected via a residual current circuit breaker. This stops the supply of electricity if the leakage current to earth exceeds 30 mA for 30 ms or it has an earth tester circuit.

When using an extension lead, check the minimum cross-sections of the cable:

Cable length m	Cross section	
	<16 A	<25 A
up to 20 m	ø1.5mm²	ø2.5mm²
20 to 50 m	ø2.5mm²	ø4.0mm²

Arrange the electrical parts (sockets, plugs and couplings) and lay down the extension lead so that the protection class is maintained.

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Never spray water on to the upper section of the vacuum cleaner. Danger for persons, risk or short-circuiting.

Observe the latest edition of the IEC regulations.

Tool socket

Use the socket on the vacuum cleaner for the purpose defined in the operating instructions only.

Before plugging an appliance into the appliance socket:

1. Switch off the vacuum cleaner
2. Switch off the appliance to be connected.

CAUTION!
Follow the operating instructions and safety instructions for appliances connected to the power tool socket.

Maintenance, cleaning and repair

Only carry out maintenance work described in the operating instructions.

Always pull out the mains plug before cleaning and maintenance of the vacuum cleaner.

During maintenance and cleaning, handle the vacuum cleaner in such a manner that there is no danger for maintenance staff or other persons.

In the maintenance area
– use filtered compulsory ventilation
– wear protective clothing
– clean the maintenance are so that no harmful substances get into the surroundings.

Before removing the vacuum cleaner from the area contaminated with harmful substances:
– clean the outside of the vacuum cleaner, wipe it clean or pack the vacuum cleaner in well sealed packaging
– and avoid spreading deposited harmful dust.

During maintenance and repair work all contaminated parts that could not be cleaned satisfactorily must be:
– packed in well sealed bags
– disposed of in a manner that complies with valid regulations for such waste removal.

A dust test must be performed at least once every year by Nilfisk-Alto service or a trained person. This test includes, for example, whether there is damage to the filter, the vacuum cleaner is sealed to the air and the control equipment works properly.

Accessories and spare parts

Use only the brushes supplied with the vacuum cleaner or specified in the operating manual. The use of other brushes can adversely affect safety.

Use only original Nilfisk-Alto accessories and spare parts (see section 9.5). The use of other parts can adversely affect safety.

2 Description

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2.1 Purpose

Depending on how hazardous the dust is, the cleaner must be fitted with appropriate filters. See table in section 5.1.1.

2.2 Operating elements

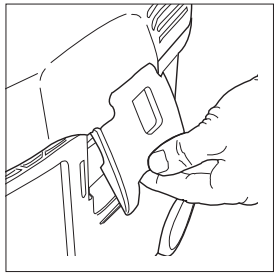
See fold-out page at the front of these operating instructions.

1 Handle
2 Suction pipe support
3 Accessory holder
4 Applicance switch with suction power control
5 Filter for air supply to motor
6 Retaining clamp
7 Tank locks
8 Dirt tank
9 Castor with brake
10 Inlet fitting
11 Appliance socket
12 Hose diameter setting
13 Cable hook

3 Before start-up

3.1 Assembling the cleaner

On delivery some of the accessories are lying in the tank and must be removed before the vacuum cleaner is used for the first time.
Remove the upper section of the vacuum cleaner:
The mains plug should not be inserted into a socket.

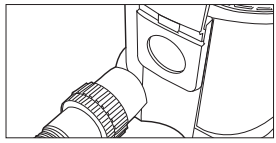


1. Open the retaining clamps and lift off the upper section of the cleaner.
2. Take the accessories out of the dirt tank and the packaging.
3. To pick up dust with maximum room concentration values:
   Insert the filter bag into the dirt tank according to the instructions (instructions included).
   To pick up harmless dust:
   Insert the disposal bag (instructions included) into the tank.
   IMPORTANT: Press the filter bag connection firmly on to the inlet fitting.
4. Fit the upper section of the vacuum cleaner and close the retaining clamps.
   NOTE: Ensure that the retaining clamps fit properly.

4 Operation

4.1 Connections
4.1.1 Connecting the suction hose

The suction hose diameter must suit the position of the switch in order to pick up dry, nonflammable dust with maximum room concentration values.



1. Connect the suction hose.

4.1.2 Electrical connection

The operating voltage shown on the rating plate must correspond to the voltage of the mains power supply.

Never use extension leads, couplings and adapter when picking up flammable dust.

1. **Ensure that the vacuum cleaner is switched off.**
2. Insert the power cord into a properly installed and fused socket with an earthing contact.

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4.1.3 Connecting electrical appliances

To comply with regulations, only approved dust producing tools should be connected.
The maximum power consumption of the connected power tool is stated in section 9.4 "Technical data".

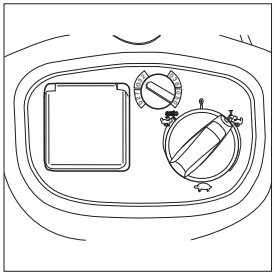
1. **Ensure that the electrical appliance is switched off.**
2. Connect the electrical appliance to the appliance socket on the control panel.

4.2 Switching on the vacuum cleaner

4.2.1 Switch position "I"

The hose diameter and the setting for the suction hose diameter must be the same.

Hose ø	*Hose diameter setting*
ø27	*ø27*
ø32	*ø32*
ø36	*ø36*
ø50	*ø50*



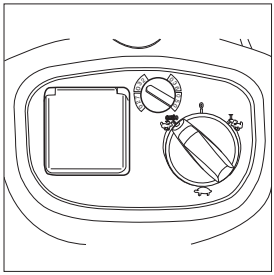
1. Turn the switch to position „I".

The vacuum cleaner motor starts.

4.2.2 Switch position „auto"

The hose diameter and the setting for the suction hose diameter must be the same.

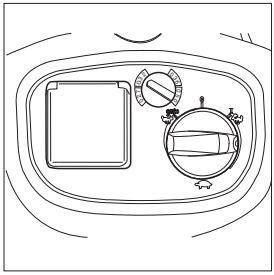
Hose ø	*Hose diameter setting*
ø27	*ø27*
ø32	*ø32*
ø36	*ø36*
ø50	*ø50*



Before switching the switch to position „auto", ensure that the tool connected to the appliance socket is switched off.

1. Turn the switch to position „auto". The vacuum cleaner motor starts when the connected appliance is switched on.
2. When the power tool is switched off the vacuum cleaner continues to run for a short moment so that any dust in the suction hose is conveyed to the safety filter bag.

4.2.3 Suction power control



The motor speed and the suction power can be varied with the suction power control. This allows precise adaptation of the suction power for different cleaning tasks.

4.3 Check volume flow monitor

Before picking up dust with maximum room concentration values:

1. Check that all the filters, including the filter for supply air to the motor, are present, properly fitted and not damaged.
2. When the motor is running, hold the suction hose shut. An acoustic warning sounds after approx. 1 second.

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4.4 Acoustic warning

For safety reasons, an acoustic warning sounds if the air speed in the suction hose drops to below 20 m/s. See section “Troubleshooting”.

5 Applications and techniques

5.1 Techniques

If used correctly, additional accessories, suction nozzles and suction hoses can enhance the cleaning action and reduce the cleaning effort.

Effective cleaning is achieved if you follow just a few guidelines in combination with your own practical experience in special fields.
Here are some basic tips.

5.1.1 Picking up dry substances

Do not pick up flammable substances.

The suction hose diameter must suit the position of the switch in order to pick up dry, nonflammable dust with maximum room concentration values.
There must always be a safety filter bag in the tank before dry substances with maximum room concentration values are picked up. See section 9.5 “Accessories” for ordering number.

To pick up harmless dust we recommend the use of a waste bag. See section 9.5 “Accessories” for ordering number. Disposal of the picked up material is then simple and hygienic.

After picking up liquids, the filter element is wet. A damp filter element clogs more quickly when dry substances are picked up. For this reason the filter element should be washed and dried or replaced by a dry element before dry substances are picked up.

Always use a filter bag/waste bag that is suitable for the type of dust (see table):

ATTIX 791-2M/B1			
Type of dust	**Filter bag/waste bag**		**Handling/waste disposal**
• Nonhazardous coarse dust • Dust with MAC values ≥ 1 mg/m³ • Observe any additional national regulations		Waste bag No. 302001480	Waste disposal - see section 7.2.1
• Nonhazardous fine dust • Dust with MAC values ≥ 1 mg/m³ • Explosive dust, explosion class St1,St2,St3 in zone 22		Filter bag No. 302001484	Waste disposal - see section 7.2.2

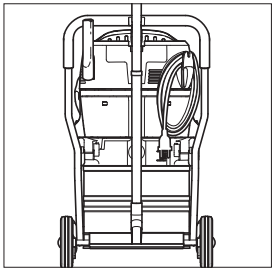
5.1.2 Picking up liquids

Do not pick up flammable substances.

Always remove the filter bag/waste bag before picking up liquids and check that the water level device functions properly (see section 7.2.5, „Replacing the filter element“).
The use of a separate filter element or filter screen is recommended.
If foam appears, stop work immediately and empty the tank.
To reduce the amount of foam, use foam killer Nilfisk-Alto Foam Stop (see section 9.5 „Accessories“ for order number).

EN 6 After finishing work

6.1 Switching the vacuum cleaner off and storage



1. After picking up hazardous dust, vacuum clean the outside of the cleaner.
2. Switch off the vacuum cleaner and pull the mains plug out of the socket.
3. Wind up the power cord and hang it on the handle.
4. Empty the tank and clean the vacuum cleaner.
5. After picking up liquids: Store the upper section of the cleaner separately so that the filter element can dry.
6. Store the vacuum cleaner in a dry room where it is protected from unauthorized use.

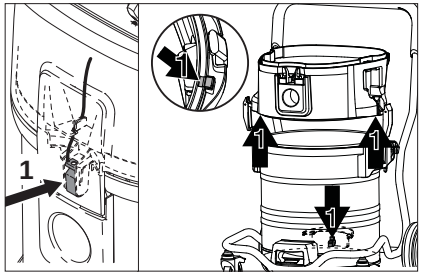
7 Maintenance

7.1 Maintenance plan

		When replacing the filter bag, waste bag or filter element	After finishing work	As required
7.2.1	check the antistatic Clamps	●		
7.2.2	Replacing the waste bag			●
7.2.3	Replacing the filter bag			●
7.2.4	Emptying the dirt tank		●	
7.2.5	Replacing filter element			●
7.2.6	Replace the filter for air supply to motor			●

7.2 Maintenance work
7.2.1 check the antistatic clamps

Do not use the cleaner with damaged or missing antistatic clamps. Risk of explosion due to static discharge in explosive atmospheres.



1. Check the antistatic clamps (1) for damage and have them replaced by Nilfisk-Alto Service if necessary.

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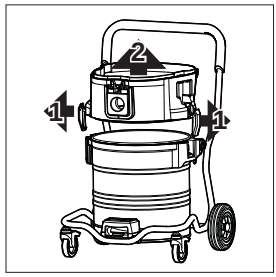
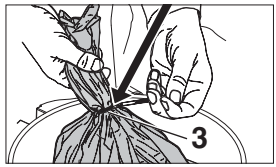
7.2.2 Replacing the waste bag

Only after picking up nonhazardous dust or dust with MAC values >1 mg/m³.

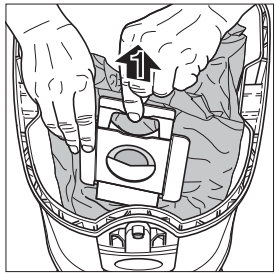


1. Remove the upper section of cleaner from the dirt tank.
2. Open the retaining clamps (1) and remove the intermediate ring (2) from the tank.
3. Close the waste bag using the cable binder (3).
4. Dispose of the dirt in accordance with legal regulations.
5. Insert a new filter bag into the cleaned tank as described in the instructions enclosed.



7.2.3 Replacing the filter bag

During the following work, ensure that dust is not unnecessarily spread around. Wear a P2 breathing mask.

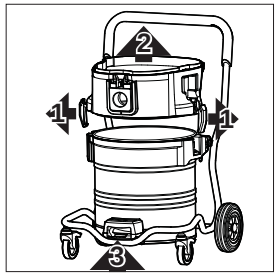


1. Open the retaining clamps and remove the upper section of the cleaner from the dirt tank.
2. Carefully remove the filter bag connection from the inlet fitting.
3. Close the filter bag connection with the slide.
4. Dispose of the filter bag in accordance with legal regulations.
5. Place a new filter bag into the cleaned tank as described in the instructions (printed on the filter bag)
   IMPORTANT: Press the filter bag connection on the inlet fitting as far as possible.

7.2.4 Emptying the dirt tank

Only after picking up harmless dust without a filter bag.

To empty the dirt tank after picking up liquids: remove the intermediate ring as a proper seal is only ensured during suction. After emptying the tank: clean the rim of the tank and the seals in the intermediate ring and the upper section of cleaner before refitting them.
If the seal or groove is dirty or damaged, the suction performance will be reduced.
Before reinserting the suction hose: clean the inlet fitting and hose collar.



1. Remove the upper section of cleaner from the dirt tank.
2. Open the retaining clamps (1) and remove the intermediate ring (2) from the tank.
3. Pull the lever in the handle (3) upwards and tilt the tank.
4. Tip out the collected dirt.
5. Dispose of the dirt in accordance with legal regulations.

or:

3. Open the tank locks (4).
4. Use the handles (5) to lift the tank out of the frame.

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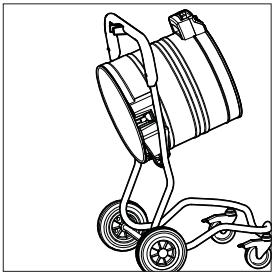
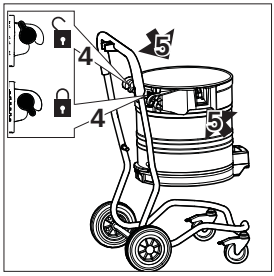


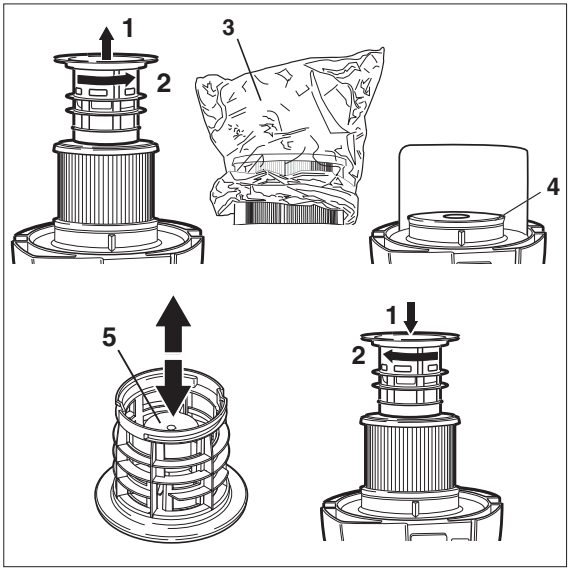


5. Tip out the collected dirt.
6. Place the empty tank in the frame and close the locks (4).
7. Dispose of the dirt in accordance with legal regulations.

7.2.5 Replacing filter element

During the following work, ensure that dust is not unnecessarily spread around. Wear a P2 breathing mask.

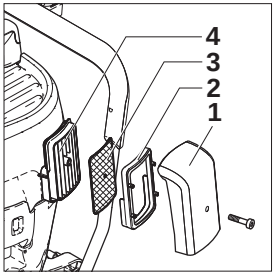
1. Open the retaining clamps and remove the upper section of the cleaner from the dirt tank. Lay the upper section of the cleaner down with the filter element facing upwards.
2. Turn the filter holder anticlockwise (1) and remove it (2).
3. Place the protective filter bag[1)] over the filter element (3).
4. Carefully remove the filter element and close the protective filter bag with a knot.
5. Clean the filter seal (4). Check it for damage and replace it if necessary.
6. Fit a new filter element.
7. Check that the float (5) works properly. When the filter holder is turned, the float inside must move about easily.
8. Fit the filter holder and turn it clockwise to secure it firmly.
9. Dispose of the used filter element in accordance with legal regulations.



Never use the vacuum cleaner without a filter.

7.2.6 Replacing the filter for air supply to motor

During the following work, ensure that dust is not unnecessarily spread around. Wear a P2 breathing mask.



1. Loosen screws.
2. Remove the filter cassette (1).
3. Remove the frame (2) with filter felt (3) from the filter holder (4).
4. Insert new filter felt and fix it with frame.
5. Attach the filter cassette and insert the screw again.
6. Dispose of used filter felt in accordance with the regulations.

[1)] Accessory. Order No. shown in section 9.5.

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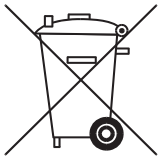
8 Troubleshooting

Fault	Cause	Remedy
‡ Motor does not start	> Fuse of the mains socket has blown.	• Connect mains fuse.
	> Overload protection switch has tripped.	• Switch off the vacuum cleaner and allow it to cool for approx. 5 minutes. If the cleaner cannot be started again, contact the Nilfisk-Alto service department.
‡ Motor does not run in automatic mode	> Power tool is defective or not connected properly.	• Check that the power tool works or that the plug is inserted correctly.
	> The power rating of the electrical tool is too low.	• Note that minimum power rating is P>40W
‡ The acoustic warning sounds. (Reduced suction power)	> Suction power selected with suction power control is too low.	• Set suction power in accordance with section 4.2.3. „Setting suction power“.
	> Hose diameter and switch position do not correspond.	• Set correct switch position for hose diameter.
	> Clogged suction hose/nozzle.	• Clean suction hose/nozzle
	> Filter bag is full.	• See section 7.2.2 „Replacing filter bag“.
	> Filter element is clogged.	• See section 4.5/4.6 „Cleaning filter element“ and 7.2.5/7.2.6 „Replacing filter element“.
‡ No suction power during wet cleaning	> Tank is full. (Float does not close the suction opening).	• Switch off the cleaner. Empty the tank.
‡ The vacuum cleaner switches off during wet cleaning	> Tank is full.	• Switch off the cleaner. Empty the tank.
‡ Voltage fluctuations	> Impedance of power supply is too high.	• Connect the cleaner to another socket closer to the fuse box. Voltage fluctuations over 7% should not occur if the impedance at the transfer point is ≤ 0.15 Ω .

EN 9 Further information

9.1 Recycling the vacuum cleaner



Make the old cleaner unusable immediately.

1. Unplug the cleaner and cut the power cord.

Do not discard of electrical appliances with household waste.

As specified in European Directive 2002/96/EC on old electrical and electronic appliances, used electrical goods must be collected separately and recycled ecologically.
Contact your local authorities or your nearest dealer for further information.

9.2 Guarantee

Our general conditions of business are applicable with regard to the guarantee. Subject to change as a result of technical advances.

9.3 Tests and approvals

The vacuum cleaners have been tested as specified in IEC/EN 60335-2-69 including appendix AA. All the requirements were fulfilled for equipment in dust class M.

The cleaners fulfil the test requirements for dust explosion protection for industrial cleaners and dust extractors for use in zone 11, type 1.

Equally, the cleaners fulfil the requirements of the ATEX regulation 94/9/EG for use in zone 22.

The vacuum cleaners must be inspected regularly in accordance with national accident prevention regulations (in Germany as specified in BGV A2 and DIN VDE 0701 Part 1 and Part 3, at regular intervals and after repairs or modifications).

A dust test must be performed at least once every year by the manufacturer or a trained person. This test covers, for example, whether there is damage to the filter, the vacuum cleaner is sealed to the air and the control equipment works properly.

EN

9.4 Technical data

ATTIX 791-2M/B1				
		EU	**GB 230V**	**GB 110V**
Voltage	V	230	230	110
Mains frequency	Hz	50		
Fuse	A	16	13	25
Power consumption	W	1200		1000
Connected load for appliance socket	W	2400	1800	1750
Total connected load	W	3600	3000	2750
Volume flow (air)	l/min	3600		
Negative pressure	Pa	23000		
Measurement area sound pressure level at a distance of 1 m, EN 60704-1	dB(A)	64		
Operating noise	dB(A)	59		
Power cord: Length	m	7,5		10
Power cord: Length		H07RN- F3G1,5	H05RR- F3G1,5	H07BQ-F3G2,5
Protection class		I		
Type of protection (splash water protected)		IP 54		
Radio interference level		EN 55014-1		
Tank volume	l	70		
Width	mm	580		
Depth	mm	605		
Height	mm	970		
Weight	kg	25		

Suction hose diameter mm	**Minimum air flow volume l/min**	**Associated negative pressure between suction hose/tool Pa**
27	690	16300
32	970	15700
36	1220	14200
50	2360	7800

9.5 Accessories

Description	**Order No.**
Filter bag (5 pcs.)	302001484
Waste bag (5 pcs.)	302001480
Filter element	302000461
Protective filter bag (10 pcs.)	30082
Nilfisk-Alto-Foam-Stop (6 x 1 l)	8469

9.6 EC declaration of conformity

CE

EC declaration of conformity

Alto Deutschland GmbH
Guido-Oberdorfer-Straße 2-8
D-89287 Bellenberg

Product:	**Vacuum cleaner for wet and dry operation**
Model:	ATTIX 791-2M/B1
Description:	110/230-240 V~, 50/60 Hz, 1200 W, Dust class M
The design of the appliance corresponds to the following pertinent regulations:	EC Machine Directive 98/37/EC EC Low Voltage Directive 73/23/EC EC EMC Directive 89/336/EC EG ATEX 94/9/EC
Applied harmonized standards:	EN 12100-1, EN 12100-2 EN 60335-1 EN 60335-2-69 EN 55014-1, EN 55014-2, EN 61000-3-2
Applied national standards and technical specifications:	DIN EN 60335-1 DIN EN 60335-2-69

Dipl.-Ing. Wolfgang Nieuwkamp
Tests and approvals

Bellenberg, 31.01.2005

Nilfisk ALTO
Why Compromise

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